

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION**

ADDENDUM NO. 1

TO INVESTIGATION ORDER NO. R9-2004-0277

**CALIFORNIA DEPARTMENT OF TRANSPORTATION AND SAN DIEGO MUNICIPAL
SEPARATE STORM SEWER SYSTEM COPERMITTEES RESPONSIBLE FOR THE
DISCHARGE OF DIAZINON INTO THE CHOLLAS CREEK WATERSHED,
SAN DIEGO, CALIFORNIA**

The California Regional Water Quality Control Board, San Diego Region finds that:

1. The table in directive 1.d.iii of Investigation Order No. R9-2004-0277 contains errors and omissions which need to be corrected. Some of the reporting values in the table lack informative descriptions, and some descriptions are in error.
2. The Toxic Units for acute effects equation [$TU_a = 100 / 96\text{-hr } LC_{50}$] in directive 1.d.iii cannot be used to calculate toxicity when there is a greater than 50 percent survival of the test species in a 100 percent test solution. In this situation, where survival of test species is between 50 and 99 percent, the following TU_a equation is appropriate:

$$TU_a = \frac{\log(100 - S)}{1.7}$$

where S = percentage survival in 100 percent test solution.

If $S > 99$, TU_a shall be reported as zero.

IT IS HEREBY ORDERED, pursuant to section 13383 of the Water Code that:

1. Directive 1.d.iii of Investigative Order No. R9-2004-0277 is replaced by the following:

The results of ambient chronic and acute water toxicity testing shall be reported as shown in the table below.

Description of Reporting Values	96-hour Acute	7-day Chronic
Mean % survival for control – the mean percent survival of the test organism in the control solution.	Yes	Yes
% Survival in 100% concentration – the percent survival of the test organism in 100% test solution.	Yes	Yes

Description of Reporting Values	96-hour Acute	7-day Chronic
Lethal concentration 50% (LC ₅₀) – the toxicant concentration that would cause death in 50% of the test population.	Yes	Yes
No-Observed-Effect-Concentration(NOEC) – the highest concentration of toxicant to which organisms are exposed in a full life-cycle or partial life-cycle (short-term) test, that causes no observable effect on survival (NOEC _{survival}); and no observable effect on growth and reproduction (NOEC _{growth/reproduction}) of the test population. This would mean that there is no significant difference between the test solution and the control, as determined by hypothesis testing.	Not Applicable	Yes
Lowest-Observed-Effect-Concentration (LOEC) – the lowest concentration of toxicant to which organisms are exposed in a full life-cycle or partial life-cycle (short-term) test, which causes adverse effects on the test organisms. The LOEC _{survival} is the lowest toxicant concentration that causes adverse effects on survival; and the LOEC _{growth/reproduction} is the lowest toxicant concentration that causes effects on growth and reproduction. This would mean that there is no significant difference between the test solution and the control, as determined by hypothesis testing.	Yes	Yes
<p>Toxic-Unit for acute effects (TU_a) – equals the reciprocal of the water sample concentration that causes 50% mortality to test organisms by the end of the acute exposure period.</p> $TU_a = \frac{100}{96\text{-hr } LC_{50}}$ <p>When it is not possible to measure the 96-hour LC 50 due to greater than 50% survival of the test species in 100% test solution, the toxicity concentration shall be calculated by the expression:</p> $TU_a = \frac{\log(100 - S)}{1.7}$ <p>where: S = percentage survival in 100% test solution. If S > 99, TU_a shall be reported as zero.</p>	Yes	Not Applicable

Description of Reporting Values	96-hour Acute	7-day Chronic
Toxic-Unit for chronic effects (TU _c) – the TU _c equals the reciprocal of the water sample concentration that causes no observable effect to organisms by the end of the chronic exposure period. $TU_c = \frac{100}{NOEC}$	Not Applicable	Yes
TU _c sublethal (growth and reproduction) – The TU _c sublethal equals 100/NOEC _{growth/reproduction} . A TU _c sublethal value of 1 indicates that no toxicity was observed.	Not Applicable	Yes
Lethal-Time for 50% mortality (LT ₅₀) – The duration of exposure in the original 100% test solution that causes mortality in 50% of the test population.	Yes	Yes

2. All directives, other than directive 1.d.iii, of Investigation Order No. R9-2004-0277 remain unchanged and in effect.

Original Signed by _____

JOHN. H. ROBERTUS
Executive Officer

Date issued: December 8, 2006